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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/663,875

09/16/2003

Shi-Lung Lin

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HOGAN & HARTSON LLP.
1999 AVENUE OF THE STARS
SUITE 1400
LOS ANGELES, CA 90067

EXAMINER

CHONG, KIMBERLY

ART UNIT

PAPER NUMBER

1635

MAIL DATE

DELIVERY MODE

01/23/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/663,875

Applicant(s)

LIN ET AL.

Examiner

KIMBERLY CHONG

Art Unit

1635

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 June 2008 and 14 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 11 and 19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 11 and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09/16/2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Status of Application/Amendment/Claims

Applicant's response filed 06/10/2008 has been considered. Rejections and/or objections not reiterated from the previous office action mailed 03/11/2008 are hereby withdrawn. The following rejections and/or objections are either newly applied or are reiterated and are the only rejections and/or objections presently applied to the instant application. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

With entry of the amendment filed on 06/10/2008, claims 1-8, 11 and 19 are pending and currently under examination in the application.

New Claim Rejections

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000.

Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1, 3, 7, 11 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Beach et al. (US 20030084471).

The instant claims are drawn to an isolated RNA comprising an artificial intron RNA that is released in a cell thereby modulating the function of a target gene wherein the cell is a mammalian or a eukaryotic cell and drawn to a cultivated cell and a composition comprising said isolated RNA.

Beach et al. teach RNA that are capable of silencing the function of exogenous target genes wherein the RNA can be expressed in a cell and the sequence includes intronic RNA (see paragraph 0020). Beach et al. teach the intronic sequences comprising functional RNA sequences can be antisense RNA or dsRNA which are capable of silencing the function of a target gene (see page 2 and paragraph 0115) and teach compositions comprising said nucleic acid sequences. Beach et al. teach the use of said sequences to silence gene expression in cultured cells (see pages 15-16).

Thus, Beach et al. anticipates claims 1, 3, 7, 11 and 19 of the instant invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8, 11 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beach et al. (US 20030084471), Krawczak et al. (Hum Genet 1992, Vol. 90: 41-54 of record PTO Form 892 mailed 03/11/2008), Zhuang et al. (PNAS Vol. 86: 2752-2756 of record PTO Form 892 mailed 03/11/2008) and .

The instant claims are drawn to an isolated RNA comprising an artificial intron RNA that is released in a cell thereby modulating the function of a target gene wherein the cell is a mammalian or a eukaryotic cell and drawn to a cultivated cell and a composition comprising said isolated RNA, wherein the isolated RNA contains a polypyrimidine tract having SEQ ID No. 2, contains a donor site as recited in claim 4, contains an acceptor site as recited in claim 5, a branch site as recited in claim 6 and a polypyrimidine tract that includes SEQ ID No. 2.

Beach et al. is relied upon as above. Beach et al. further teach RNA comprising splice donor sites and splice acceptor sites. Beach et al. do not teach a splice donor and acceptor sites, branch sites and polypyrimidine sequences containing the claimed sequences as recited in the claims.

Mitchell teach an efficient splice acceptor site having the sequence of CCACAGC (see column 12, lines 15-20) that is capable of efficiently splicing pre-mRNA along with branch sites, donor sites and polypyrimidine tract sequences.

Krawczak et al. teach a 5' splice donor site having a sequence that contains AAGTAAGT (see page 41).

Zhuang et al. teach a preferred branch site sequence for mammalian mRNA splicing having the sequence UACUAAC (see page 2752).

Coolidge et al. teach the polypyrimidine tract is essential in pre-mRNA splicing and teach the sequence of the polypyrimidine tract is flexible but for efficient splicing, the tract must contain a threshold of 8 uridine residues (see pages 888-889).

It would have been obvious to incorporate the acceptor site taught by Mitchell, the 5' donor splice site taught by Krawczak et al. and the branch site sequence taught by Zhuang et al. into the DNA template or isolated RNA comprising an intron RNA taught by Mitchell. It would have been further obvious to incorporate a polypyrimidine tract as claimed.

One of skill in the art would have been motivated to incorporate the acceptor site taught by Mitchell as it is shown this site efficiently allow proper splicing of therapeutic pre-mRNA sequence and one would have wanted to use the 5' donor splice site because Krawczak et al. teach the efficiency of splicing is critically dependent upon the accuracy of cleavage and rejoining and given this splice donor sequence has been identified as a consensus sequence for splicing, one would have wanted to use the most effective sequence for accurate splicing activity. One of skill in the art would have been further motivated to use the branch site sequence taught by Zhuang et al. because Zhuang et al. demonstrated that this sequence is preferred in mammalian cells for accurate splicing of mRNA sequence. Given Coolidge et al. teach the sequence of the polypyrimidine tract is flexible but must contain at least a threshold of eight uridines, it would have been a matter of routine experimentation to the skilled artisan to construct and test polypyrimidine tracts that would contain the claimed sequence and incorporate the optimal sequence into the claimed RNA.

Finally, one would have expected to be able to incorporate the sequences taught by Mitchell et al., Krawczak et al. and Zhuang et al. into the DNA template for the isolated RNA given both demonstrate that each sequence is capable of mRNA splicing and further teach said sequence is the preferred sequence for accurate splicing of mRNA in cells. One would have expected to be able to make and find the optimal polypyrimidine tract because Coolidge et al. teach how to make the optimal composition.

Thus in the absence of evidence to the contrary, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

Response to Applicants Argument

Re: Claim Rejections - 35 USC § 102

The rejection of claims 1-3, 5, 7-12 and 19-20 under 35 U.S.C. 102(b) as being anticipated by Mitchell, L. (US Patent No. 6,013,487) is withdrawn.

Re: Claim Rejections - 35 USC § 103

Claims 1-12 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitchell, L. (US Patent No. 6,013,487), Krawczak et al. (Hum Genet 1992, Vol. 90: 41-54) and Zhuang et al. (PNAS Vol. 86: 2752-2756) is withdrawn.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimberly Chong whose telephone number is 571-272-3111. The examiner can normally be reached Monday thru Friday between 7-4 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Schultz can be reached at 571-272-0763. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.

/Kimberly Chong/
Examiner
Art Unit 1635